

SYNCHRO—SETTE

THE SUBSCRIPTION MAGAZINE FOR THE SINCLAIR ZX-81 / TS-1000
MICRO COMPUTERS

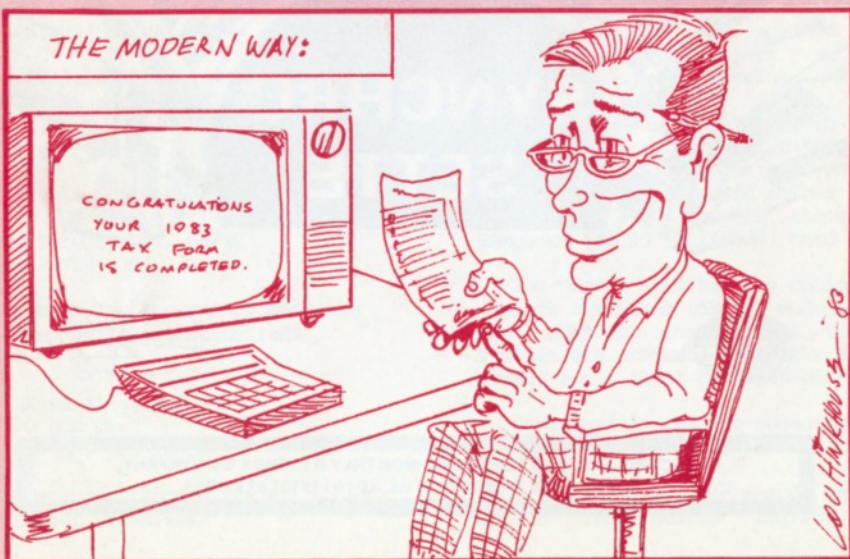
VOLUME 2 NUMBER 3 MARCH 1983 \$2.00

IT'S TAX TIME AGAIN!

THE OLD WAY:



THE MODERN WAY:



LOW HILLMAN '83



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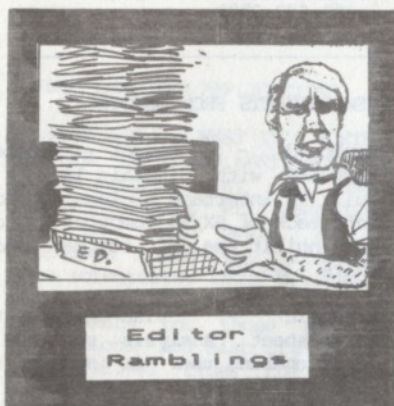
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Memotech provides a 10 day money back guarantee and 6 month warranty on all their products. For further information, contact:

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COMPUTER CRIME

Not to give anyone ideas - but FBI reports show that the average bank robber gets \$3,200 in a stickup while bank employees, not using a computer, embezzled an average of \$23,000.00. The figure jumps to \$430,000.00 when a computer is used,

according to statistics compiled in 1981.

BIONIC COMPUTER APPLICATIONS

From our FOR WHAT IT'S WORTH AND BELIEVE IT IF YOU WANT department - in the future, tiny new computers called "biochips" will mesh directly into the human brain and even reproduce themselves according to some scientists. These devices could help overcome hearing and sight impairments for those with such afflictions and also give the human brain 100,000 times the power of present computers - is the word from a professor of neurobiology at a university in North Carolina.

The thought behind this idea is to interface the computer with the human brain. The idea is not new and has been the subject of both previous predictions and science fiction stories. The implications, however, are staggering and frightening.

With our present technology, I can buy everything mentioned, except the reproduction part. But even without that, think of the potential of an individual who had such a device surgically imbedded into his person. If radio transmission equipment was interfaced to this biochip, a true telepath would exist, allowing mental communications between individuals and machines. Military applications would be astounding.

If I'm beginning to sound like a panic peddler, I don't mean to. Let us hope that if this idea ever does come to pass, it will be a benefit.

PRINTER AVAILABLE THROUGH TIMEX OUTLETS

The TS-2040 printer should be available at some of your local outlets as you read this. In the Chicago area, they are being sold by the Venture chain stores for 94.95 retail. We expect the other stores across the nation to follow suit

very soon.

This printer does not use the grey thermal paper, but instead the white thermal paper, which produces a much sharper image and contrast and sells for only 5.95 for three 56 foot rolls. By good authority (SUN) we hear the HP-85 1000 foot rolls of paper will also work. The existing roll holder in the 2040 will not hold the larger rolls, though, so the user has to make a special holder for the paper.

TS-1500 COMPUTER

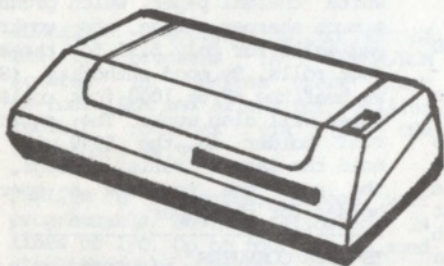
A new computer will be sold by Timex called the TS-1500 and is to be unveiled June 11th of 1983. It will be 100% compatible with the TS-1000 but will have the following features:

- real moving key keyboard
- larger enclosure (TS-2000 or Spectrum size)
- heat producing components spaced farther apart
- 16K of internal memory
- Joystick option (8/83)
output ports on computer
- solid state software capability with plug-in modules besides tape software capability.
- telephone hook-up with the TS-1050
phone modem.
- projected price - 99.95

This, I believe, can be interpreted as bad news for the after-market keyboard companies. For the price of a keyboard, a person can buy one with a 16K computer.

Timex has also announced a drop in the retail price of the TS-1000 from 99.95 to 69.95 and with the factory rebate good to the end of April/83 of 15.00, the final price to the consumer is 54.95.

- continued on page 19 :::



**The GP-100A
Printer From
Memotech**

For those of you who don't like thermal paper printers and/or have applications that require more than 16, 32 or 40 columns of printout and also want the crisp character image of a dot matrix printer, the least expensive, ready-to-go, 80 column, ink cartridge, tractor feed, plain paper print available for the ZX/TS computers that I am aware of is the Seikosha GP-100A printer from Memotech.

\$400.00 may sound like a lot of bread to shell out for a printer that serves a computer that cost under a hundred bucks.

This may be true - but being in the computer business for some time now, my own opinion is that this is super-cheap for what you are getting. Walk into any computer store and ask the price of their cheapest printers. Add to that the cost of interfacing equipment needed for other computers and you'll soon see what I mean.

Although this is not a letter-quality printer, it is far superior to what the lower priced printers produce. A business could use it for correspondence and in-house data-printouts. The programs in this month's issue were

Besides, if an individual in the future wanted to step up to a better quality printer, the same interface that comes with the GP-100A will allow the change, providing it uses a Centronics type parallel connector. Memotech offers other more elaborate printers also.

One thing you get for your 400 bucks is fast service. There is not, to my knowledge, any other company selling ready-to-go printers for the TS/ZX computers that ships in less than 30 days and many are over 60 days. I got mine from Memotech in six. Memotech is the King when it comes to consistently fast service for all products I have ordered (Data-Assette is very fast too).

If you order by charge card or with a money order or certified check, you can expect quick response. Personal checks may require as much as six weeks to clear before shipping.

OPERATION

The first thing I noticed, after it was hooked up, was that it didn't work!

I continuously tried to LLIST a program and the matrix head kept printing all the characters of a line in the same position. The darn head wouldn't move. With the power off, I tried to move the head to the right by hand, and I noticed a tremendous amount of resistance as the head kept pushing against what I thought was a big spring. Upon closer examination, I found this wasn't a spring at all but a piece of black convoluted plastic tubing that had been placed on the matrix head guide bar to prevent damage while shipping.

What a bone-head play on my part. In my own defense, I might say that, try as I may, I couldn't find anything in the documentation about this. I think it's possible that if I would have kept trying to make the printer print, damage may have

occurred. After this tubing was removed, the printer operated perfectly.

The main reason I bought it was to reproduce program listings. The other printers that I have just didn't give good enough quality copy image for the company that prints the magazine to reproduce.

The old method of making these program listings was to first make a printout from one of the smaller printers and then copy it by hand into the word-processor computer. It isn't that difficult to find someone to proof-read written words but to find someone to proof-read computer programs is a horse of a different color. Even programmers can easily make mistakes.

But if a program is de-bugged in the computer and the computer printer generates a legible listing, the problem is solved.

What a pleasure to use. The COPY command instead of LLIST is perfect for creating program listings. LLIST prints the listing in 80 columns which is unsuitable for magazine layouts. COPY prints the screen exactly as displayed. The user then lists the program on the screen with the next possible line number and COPYs it again and continues this process until the full printed listing is complete.

The only suggestion I can make which, without it, can cause some minor difficulty, is that the user should introduce an LLPRINT command by itself to the keyboard before trying to print out any data or listing. If this does not occur, some weird characters or spacing may occur before the first desired characters are printed. Also, if the user tries to print any of the Sinclair graphics characters, the printer will either hang up and power must be reset or the printer will ignore the graphic characters and continue past them.

Inverse characters are okay, though, and will be printed as

lower-case.

The print speed is listed at 30 characters per second. This is misleading though, because it doesn't take into account the conversion time needed by the Memotech interface to convert the Sinclair code into ASCII. The printer will print a line, pause for a while and then print the next line, and so on.

The character matrix is 5 by 7 and spacing is 10 characters per inch with maximum character height being 2.82 mm and width at 2.11 mm. The paper is standard 9 1/2 by 11 inch fanfold that can be purchased at any computer store and the ink ribbon cartridge can be purchased at any Radio Shack. The printer can be purchased at Radio Shack also but it's about \$100.00 cheaper with the interface through Memotech. The Tractors can be adjusted from 10 inches wide down to 4 1/2 inches which makes it a dynamite machine for tractor-fed labels for those of you who are serious about mailing lists.

The original, plus up to two copies, can be printed at a time. The printer is relatively quiet and stable while operating compared to some others that I have and have seen that really jump around and are quite noisy.

My next project is to try to find out how to use the interface with some of my other parallel printers which I haven't been successful with as of yet. Oh well, I'll keep trying.

For further information contact:

Memotech Corporation
7550 West Yale Ave.
Suite 200
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303-986-1516

(tell em you read about
it in Synchro-Sette)



HISTORY The EDVAC and IAS

In a period between 1947 to 1950, a device called the EDVAC (Electronic Discrete Variable Automatic Computer) was constructed at the Moore School of Electrical Engineering - University of Pennsylvania.

It was to be a much more powerful machine than the ENIAC but smaller, being of serial and synchronous design. It contained some 5,900 vacuum tubes and 12,000 semi-conductor diodes.

Unlike today's machines that have words (bytes) designed to contain bits (binary digits) in the amounts of multiples of 2 (the TS-1000 uses the Z-80 micro-processor which is an 8-bit device), the EDVAC had 44-bit words.

The memory storage devices were unique for their day. Ultrasonic signals were produced from electrical signals through an ULTRASONIC DELAY LINE. The sound pulses were then introduced into a container of mercury fluid.

Since the fluid would transmit the sound waves at a much slower rate than the original electrical pulses traveled through the wire, a delay was involved that would allow the ultrasonic delay line to change the sound pulses back into electrical pulses and perpetuate the effect continuously. The delay time was set by adjusting the length of the fluid container. Piezoelectric crystals, much like those in telephone receiver assemblies for sound transmission and reception, were responsible for the conversion

of electrical impulses to sound and vice-versa.

John von Neumann, a distinguished computer consultant, had been hired by the Moore School to utilize his special talents, one of which was total mental recall or what we may call a photographic memory.

Neumann developed the first stored program, designed to sort and merge data. He also discovered that with the EDVAC's design, parallel accumulators, such as those used by ENIAC (20 in all), could be done away with. The speed and serial operation of the new machine had made them obsolete.

Today, many of you have asked what the advantages of serial over parallel interfacing are and the advantage is primarily speed. The disadvantage is that serial interfacing usually requires additional programming for data transfer and also parallel interfacing techniques have improved where speed has increased tremendously.

The internal memory storage medium of EDVAC was comprised of 128 thermostatically controlled acoustic delay lines, each storing 384 bits of data as sound waves in the mercury fluid medium with the information circulating constantly through the line. 1024 bits or 128 eight bit words of fast access storage was available per fluid container with an access time of 48 to 384 microseconds.

The EDVAC had diode logic

circuits which permitted mathematical subtraction operations to be performed directly rather than through reciprocal addition, such as the method used in the SUBTRACTION program on our FEB/83 cassette.

Average time for addition was 864 microseconds and for multiplication was 2900 microseconds. I/O media included paper tape, tele-typewriters and punched cards.

The computer projects at the Moore School attracted less funding and attention as years went on, and the staff began breaking up with some of them going to Princeton University.

Finally, in 1950 the EDVAC was moved to the Aberdeen proving grounds and the Moore School disbanded the ENIAC/EDVAC programs and staff, primarily because of disinterest.

By this time, however, a program at Princeton was in full swing with many of the former Moore School staff members, including von Neumann and the IAS computer was born. The development stage was from 1946 to 1952 and was primarily under von Neumann's direction.

The IAS was a marvel in miniaturization for its time. Measuring only 2 by 8 feet, exclusive of I/O equipment, it contained some 2300 vacuum tubes (mostly double triodes) and was constructed of three registers.

The first housed a parallel adder, the second a control unit and the third an electrostatic memory composed of 40 CRTs. The electrostatic memory had a capacity of 1,024 forty bit words and each cathode ray tube (CRT) had an array of $32 \times 32 = 1024$ charged spots on the phosphor surface.

This electrostatic storage tube device was much faster than the ultrasonic-mercury fluid canister delay line. Negative numbers were represented by compliments. Multiplication was done by

successive addition (see the MULTIPLY program, AUG/82 cassette for formula) and division by successive subtraction.

The IAS computer stored its programming instructions (early machine language) in the CRT memory which included commands for basic arithmetic operations, shifting, input, output, unconditional transfer and conditional transfer (branching).

The computer revolution was now gaining momentum throughout western Europe and the U.S. and before the IAS was completed, companies such as Rand Corporation and IBM already had projects started that made the IAS obsolete.

The mercury delay line used on the EDVAC, although slower than some of the newer devices, was not made obsolete yet and versions of it appeared on later computers such as the UNIVAC -- Ed.

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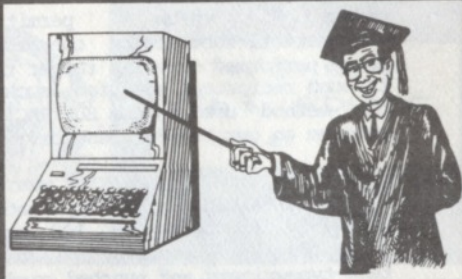
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the Computer Tutor

READ - DATA - RESTORE
REVISITED



Good morning, class! Happy St. Patrick's day to you all.

What's this on my desk - a six pack of bottled green beer. Just what I wanted. No need to guess who brought it. You can all turn around and stop smiling at him.

Many of you were not in our first class back in April of 1982 when we discussed simulating READ, DATA and RESTORE commands.

I'll give you a sample of a program that would work on most other computers but not on the Sinclair machines.

* UNUSABLE PROGRAM *

```
10 DATA JANUARY,FEBRUARY,MARCH,
    APRIL,MAY,JUNE,JULY,AUGUST,
    SEPTEMBER,OCTOBER,NOVEMBER,
    DECEMBER
20 FOR N=1 TO 12
30 READ A$
40 PRINT A$
50 NEXT N
60 RESTORE
70 GOTO 20
```

If we were to RUN this program on most other computers, the following list would be displayed on the CRT:

JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

OCTOBER
NOVEMBER
DECEMBER

The DATA command allows us to insert a data file in a program line. The READ command allows us to pick out and separate these data items, one at a time. The RESTORE command resets the pointer that is locating each data item back to the first data item.

The purpose of these three commands is to allow the programmer to store data in the program lines themselves for recall at a later time.

Let us say that we only wanted to see one particular month. We might add or change these lines:

```
15 PRINT "WHAT IS THE NUMBER OF
    THE MONTH YOU WANT TO SEE?"
16 INPUT A
40 IF N=A THEN PRINT A$
```

Now when the program is RUN, we ENTER the number of the month we want to see, such as the number <5> and we are greeted with the display of only that month on the CRT:

MAY

Of course, most of you do not have other computers to test this on so it's all academic up to this point, anyway.

The point I'm trying to make is that we have here a very efficient method of retrieving data from the program with a minimum of program

lines being used.

We could, of course, accomplish this on the ZX/Ts machines with a program using a string variable array such as the following:

```
* USABLE PROGRAM BUT *  
*   INEFFICIENT   *  
10 DIM A$(12,9)  
20 LET A$(1)="JANUARY"  
30 LET A$(2)="FEBRUARY"  
40 etc.
```

and recall the months with a FOR/NEXT loop. As you can see we use up 12 program lines just to enter the data into variables, not to mention the FOR/NEXT loop and other program lines that will be needed. There's got to be an easier way - there is. ENTER the following program:

```
* USABLE EFFICIENT PROGRAM *  
10 LET A$="JANUARY,FEBRUARY,MAR  
CH,APRIL,MAY,JUNE,JULY,AUGUST,S  
EPTEMBER,OCTOBER,NOVEMBER,DECEMB  
ER,"  
20 LET M=1  
30 FOR N=1 TO LEN A$  
40 IF A$(N)=",," THEN GOSUB 100  
50 NEXT N  
60 STOP  
100 LET B$=A$(M TO N-1)  
110 PRINT B$  
120 LET M=M+1  
130 RETURN
```

This accomplishes the same thing that the first, unusable program does but in 10 lines instead of the original 7 - a considerable savings of programming effort over the method that assigns data to the string variable array.

You may also notice that in line 10 of that program, we have set up the string <A\$> to allow 12 inputs of a maximum length of 9 characters each. The 9 character maximum length is to allow the month of SEPTEMBER to be used. But all the rest of the months have less than 9 characters. MAY has only 3 characters. We have to dimensionalize the array to allow

the maximum amount of characters that it will use. If we have less, it will truncate or chop off any characters over the stated amount from the end of the word.

We therefore have all those empty spaces that aren't used and guess what? That's right, they take up memory space. This means our program size is going to be larger and we are penalized as to the amount of data items we can have. The last program is much more efficient in this respect.

But what if we want to single out an individual month or data item like we did in the unusable program? We have to be tricky here. Add or change the following lines:

```
15 LET B=0  
16 PRINT "WHICH MONTH DO YOU W  
ANT TO SEE?"  
17 INPUT A  
105 LET B=B+1  
110 IF B=A THEN PRINT B$
```

Now if we RUN the program and ENTER <5> to the prompt, we will see MAY displayed. This is about where we left off last April. A very powerful routine, indeed, and the breakout portion of the routine as evidenced by those last five lines can be used in other types of READ, DATA & RESTORE simulation, as we shall soon see.

Perhaps we are not concerned with the DATA being stored in a program line. We may not even care if it is lost after we shut the computer off and reload the original program back in at a later date. A good example would be where we need to store data that is being created by the program but have no need for that data after it was printed out or copied from the screen or possibly it was just random data for a display example. We can POKE that data into higher memory locations that are not being used by the main program.

How do we know where those locations might be? The gentleman in the rear has his hand up.

LIST the program and you, of

You are about to witness something strange. ENTER the CLEAR command and the ENTER GOTO 1000.

The data is fixed in the assigned memory locations which has nothing to do with the variables. Neat, huh?

10 REM

```

20 LET S=16514
30 LET N=1
100 SCROLL
110 SCROLL
120 PRINT "INPUT NAME NO.,"N
130 INPUT A#
135 IF A#="" THEN GOTO 260
140 SCROLL

```

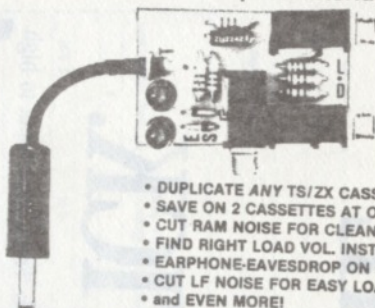
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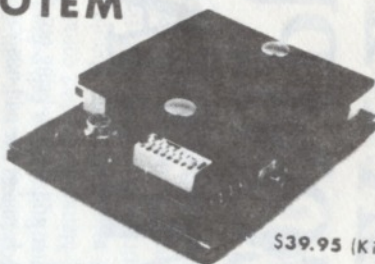
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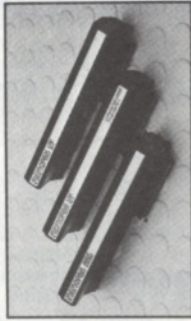
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CORPORATION

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Just a few of our widely acclaimed products for the TS1000/ZX81.

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- Tutor Cont.

```

150 PRINT ,A#
160 SCROLL
170 PRINT ,,
180 FOR I=1 TO LEN A#
190 POKE S,CODE A$(I)
200 LET S=S+1
210 NEXT I
220 POKE S,26
230 LET S=S+1
240 LET N=N+1
250 GOTO 100
260 POKE S,255
500 SCROLL
510 SCROLL
520 PRINT "PRESS ENTER TO SEE L
IST :":
530 INPUT A#
1000 LET S=16514
1010 LET B$=""
1020 IF PEEK S=26 THEN GOTO 1060
1030 LET B$=B$+CHR$(PEEK S)
1040 LET S=S+1
1050 GOTO 1020
1060 SCROLL
1100 SCROLL
1110 PRINT B$
1120 SCROLL
1130 IF PEEK S+PEEK (S+1)=261 TH
EN STOP
1140 LET S=S+1
1150 GOTO 1010
2000 FAST
2010 LET G=695
2020 FOR N=16514 TO 16513+G
2030 POKE N,155
2040 NEXT N
2050 SLOW

```

Yup, that's 695 periods after the REM statement in line 10. Oh, by the way, as you probably know, it's easier and takes less time if you put the computer into the FAST mode before you start entering program lines.

You say you didn't know that and entered all those periods in the SLOW mode? Sorry about that (ha, ha, ha). Don't forget to put the computer back in the SLOW mode when you RUN the program.

This program also pokes the entered data into memory but in an area BEFORE the main program locations. That's the purpose of the periods after the REM statement in line 10. Actually, just about any

character will do, but the periods are easy to eyeball, as we will soon see.

RUN the program and ENTER a bunch of names when the prompt is displayed. When you get tired of doing this, just press ENTER for the prompt and a list of what you entered will be displayed. Now LIST the program and observe what's in line #10.

Pretty nifty, I'd say! To clear the data, ENTER GOTO 2000. When you observe the listing, you'll see inverse periods in the DATA line #10. This is controlled by the number at the end of line 2030. You can consult the character set chart at the back of the owner's manual if you want a different character.

I'm sure some enterprising programmer will find this technique useful.

Moving right along, we'll go on to the next program. SAVE the old and ENTER the new:

```

10 LET N=1
20 LET A$=""
100 SCROLL
110 PRINT "ENTER ITEM NO. ";N
120 INPUT B#
130 LET A$=A$+B$+", "
140 IF B$="" THEN GOTO 200
150 SCROLL
160 LET N=N+1
170 PRINT ,B#
180 SCROLL
190 GOTO 100
200 CLS
210 PRINT AT 12,0;A$
220 SCROLL
230 PRINT "PRESS ENTER TO SEE I
TEMS :":
240 INPUT B#
250 LET C=1
260 FOR N=1 TO LEN A$
270 IF A$(N)>=", " THEN GOSUB 300
280 NEXT N
300 SCROLL
320 SCROLL
330 PRINT A$(C TO N-1)
340 IF A$(N TO N+1)>=", " THEN G
OTO 400
350 LET C=N+1
360 SCROLL

```

```

370 RETURN
400 SCROLL
410 SCROLL
420 PRINT "DONE - PRESS ENTER T
O SEE 1 ITEM"
430 SCROLL
440 INPUT B#
450 CLS
470 PRINT AT 10,0;"WHICH ITEM D
O YOU WANT TO SEE?"
480 INPUT B
485 LET I=0
486 LET C=1
490 FOR N=1 TO LEN A#
500 IF A$(N)="," THEN GOSUB 600
510 NEXT N
520 SCROLL
530 SCROLL
540 PRINT "THERE IS NO ITEM NO.
",B
550 PAUSE 200
560 GOTO 450
600 LET I=I+1
610 LET B#=A$(C TO N-1)
620 IF I=B THEN GOTO 700
630 LET C=N+1
640 RETURN
700 CLS
710 IF B#="" THEN GOTO 520
720 PRINT AT 10,0;"ITEM NO.";B;
" IS"
730 PRINT B#
740 PAUSE 200
750 GOTO 200

```

RUN this program and ENTER the months of the year for the data items. Just press ENTER for the prompt after all the months are entered. The program now will display the string variable containing the data with the separating commas. You will notice that the string ends with two commas. This is a marker designed to stop search routines later in the program.

If we press ENTER, the individual months will be scrolled on the screen. Not much different so far than what we have seen the other routines do.

But, what if we wanted to single out a single month? Press ENTER and ENTER the number of the month you want to see and that month will be displayed.

This technique was used in the game SCRAMBLED WORDS that appeared on the June/82 cassette where 200 five letter words were held in a data variable and one was picked out at random. A similar effect can be achieved by changing line #480 to read:

```
480 LET B=INT (RND*12) +1
```

The program can be initiated intact by entering GOTO 400. A month picked at random will be displayed on the screen. This is also a useful technique where a number of data string routines can be combined in a single program to produce random sentences such as in the ARTIFICIAL INTELLIGENCE program in the MAY/82 issue.

Perhaps you would like to be able to search through a data string by entering just a portion of that name you are looking for. In the case of our file of months, the month of December is the only one that starts with a <D> but there are three months that start with <J>. <JA> is good for finding January but <JU> will find June if you are looking for July.

In other words, if you want to find a certain data item, you have to type in enough characters unique to the same amount of characters that begin the data item. But what if you are looking for the <A> in April. Since it is the first month that begins with <A>, you would be safe in assuming that you would only need that letter for the search, right?

Wrong! The routine would search for the first <A> in the string and would encounter it in JANUARY and <ANUARY> would be printed. Fortunately, The following routine can be added to the last program and will take care of this problem. Add or change the following lines:

```

750 CLS
760 PRINT AT 10,0;"SEARCH BY PA
RTIAL NAME : : : ENTER PARTI
AL NAME?"
770 INPUT B#

```


- Ed. Ramblings Cont.

Thanks to Bill Wright of the Sinclair Users' Network (SUN) for this information.

Ed. note - look for the TS-1000 to be phased out by the end of the year.

SUN INCREASES SUBSCRIPTION PRICE

The SUN is now bigger and better. For those of you not familiar with the SUN newsletter, they are a consulting company that many supporting companies for the TS/ZX products rely on for product reviews (including Timex themselves).

If you want to know first hand about new hardware and software before it comes out, I suggest you subscribe to their newsletter. The old price of \$12.00 for 12 monthly issues has been increased to \$16.00. For further info contact:

S.U.N.
Sinclair Users' Network
2170 Oakbrook Circle
Palatine, IL, 60074
312-934-9375

TS-2000 & TS-3000 NEWS

Don't expect to see the TS-2000 hit the streets until the final quarter of this year. Apparently, the 2000 will be vastly improved over the Spectrum. The printer interface and other I/O problems that plagued the European version will be corrected by Timex and the time involved necessitates the late arrival.

Sinclair has under wraps the ZX-83 computer and Timex, the TS-3000 - both to be introduced in 1984 - projected cost of the 3000 - under a thousand dollars. All attempts to extract product info from stateside Timex & Sinclair company sources have proved fruitless, so we have absolutely no official spec. info. on either unit, but we hear that the following features are being considered to be incorporated as standard equipment into the units:

- continued on page 22 :::

```
800 FOR N=1 TO LEN A$-LEN B$+1
810 IF A$(N TO N+LEN B$-1)=B$ THEN GOTO 900
820 NEXT N
830 PRINT "PARTIAL NAME NOT IN FILE"
840 PAUSE 200
850 GOTO 200
900 FOR A=N TO LEN A$
910 IF A$(A)=" " THEN GOTO 1000
920 NEXT A
1000 LET C$=A$(N TO A-1)
1010 CLS
1020 PRINT AT 10,0;C$
1030 PRINT "IS THIS THE CORRECT ITEM?"
1040 INPUT D$
1050 IF D$(1)="N" THEN GOTO 1100
1060 GOTO 840
1100 LET N=A
1110 GOTO 820
```

Voila! When the program cycles to this routine, we are now asked for the partial group of characters that would be pertinent to the data item we wish to display - AND allows a further search if the wrong one was encountered.

Experiment with this routine by entering single letters and two letters for items that start with the same first two characters, such as June and July.

Imagine how useful this would be for finding any data items such as last names in a mailing list file.

These techniques are very memory efficient as compared to dimensionalizing string variables where as much as 50% of memory space may be wasted.

I hope this helps all of you who have been asking about how to simulate READ, DATA and RESTORE on the TS/ZX machines.

Oh, there's the bell. How quickly these classes go by. Looking at these bottles more closely, I see that they're not green beer at all. I didn't know they sold Liquid Plumber in six-packs!

BREAK-EVEN Analysis Program



Businesses are constantly confronted with the problem of finding out how much of a product they have to sell in order to turn a profit. Many elaborate programs have been written just on this subject. Here is a simple program that can be used and understood even if you aren't in business yourself:

```

10 PRINT AT 10,6;"BREAK-EVEN
ANALYSIS"
20 PRINT ,,"PRODUCES COSTS/REV
ENUE SCHEDULES"
30 PAUSE 200
40 FOR N=1 TO 6
50 SCROLL
60 NEXT N
70 PRINT "WHAT ARE THE FIXED C
OSTS?"
80 INPUT F
90 SCROLL
100 PRINT ,F
110 SCROLL
120 SCROLL
130 PRINT "WHAT IS THE PARTS CO
ST PER UNIT?"
140 INPUT V
150 SCROLL
160 PRINT ,V
170 SCROLL
180 SCROLL
190 PRINT "WHAT IS THE UNIT SEL
LING COST?"
200 INPUT P
210 SCROLL
220 PRINT ,P
230 SCROLL
240 SCROLL
250 PRINT "UNITS IN STOCK AT ST
ART?"

```

```

260 INPUT B
270 SCROLL
280 PRINT ,B
290 SCROLL
300 SCROLL
310 PRINT "UNITS IN STOCK AT F
NISH?"
320 INPUT C
330 SCROLL
340 PRINT ,C
350 SCROLL
360 SCROLL
370 PRINT "ANALYSIS INCREMENT
380 INPUT S
390 SCROLL
400 PRINT ,S
410 PAUSE 200
420 FAST
430 CLS
432 PRINT ,,"DO YOU WANT HARD
OPY?"
434 INPUT Y#
440 SCROLL
450 PRINT "QUANT COST REV P
L UN COST"
455 IF Y#(1)="Y" THEN LPRINT "
UANT COST REV P/L UN COST"
457 IF Y#(1)="Y" THEN LPRINT
460 LET D=F/(P-V)
470 LET G=P*D
480 LET H=F+V*D
490 SCROLL
500 SCROLL
510 SLOW
520 IF B=0 THEN LET B=B+S
530 FOR N=B TO C STEP S
540 LET R=P*N
550 LET E=F+V*N
560 LET U=E/N
565 LET U=INT (10*U+.5)/10
570 LET A=R-E
580 IF N<D THEN GOTO 1000
590 PRINT "-----
"
595 IF Y#(1)="Y" THEN LPRINT "-----
"
600 SCROLL
610 PRINT INT D;TAB 6;INT H;TAB
12;INT G;TAB 18;"BREAK-EVEN"
613 SCROLL
615 IF Y#(1)="Y" THEN LPRINT IN
T D;TAB 6;INT H;TAB 12;INT G;TAB
18;"BREAK-EVEN"
620 SCROLL
630 PRINT "-----
"
635 IF Y#(1)="Y" THEN LPRINT "-----
640 SCROLL
650 LET D=99999999
1000 PRINT N;TAB 6;E;TAB 12;R;TA
B 18;A;TAB 24;U
1003 SCROLL

```



```

1005 IF Y*(1)="Y" THEN LPRINT N;
TAB 6;E;TAB 12;R;TAB 18;A;TAB 24
;U
1010 SCROLL
1020 SCROLL
1030 NEXT N
1040 SCROLL
1050 SCROLL
1060 PRINT "QUANT COST REV P/
L UN COST"

```

An example of how this program can be used is to put yourself in a role where you have to make a decision on what quantity of supplies have to be ordered in order to make a profit off the finished product that uses those supplies.

Let us say that your company, The XYZ Corporation, has been asked by ACME Enterprises to give an estimate on the purchase price of a product you would manufacture for them, the Widget Model 2 (or W-2). ACME wants to know the price breakdown for quantity costs.

Your company, ACME, is probably one of many companies to give a bid, so you know your price has to be competitive.

RUN the program. The first prompt asked us for the fixed price. This is what it would cost for enough components up to the first price break. Let us say that we wanted to make 1000 Widgets. To do this we would need to purchase \$300.00 worth of materials and the costs for labor time and utility use (electricity, etc.) is another \$150.00 for a total of \$450.00.

ENTER <450> for the first prompt.

The second prompt asks for the price per unit. Since we are looking at 1000 Widgets at that cost, this would mean each would cost .45 cents.

ENTER <.45> for the second prompt.

The next prompt now asks what we want to charge for each unit. At

this point we invent a ballpark figure because we are shrewd business people and have had many years of experience in doing this. We estimate that each Widget should sell for 1.95 in lots of 1000.

ENTER <1.95> for the third prompt.

We are now asked for the stock of our present inventory. If we already are manufacturing this product and have a stock we can put in that number. If this is a first time run, we can enter <0>.

ENTER <0> for the fourth prompt.

The program now asks us for the inventory stock at the end of the run. In our example it will be 1000.

ENTER <1000> for the fifth prompt.

ENTER the ANALYSIS INCREMENT NUMBER. This is a number that will increment the start (0 items) to the finish (1000 items). For our example we will use 100.

ENTER <100> for the sixth prompt.

The screen now clears and we are asked DO YOU WANT HARD COPY? That's right! If you have a printer, you can have a hard copy of the data.

The following data will be displayed:

QUANT	COST	REV	P/L	UN COST
100	495	195	-300	5
200	540	390	-150	2.7

300	585	585	BREAK-EVEN	

300	585	585	0	2
400	630	780	150	1.6
500	675	975	300	1.3
600	720	1170	450	1.2
700	765	1365	600	1.1
800	810	1560	750	1
900	855	1755	900	1
1000	900	1950	1050	0.9

1. The first column shows the incremented quantities produced.
2. The second column shows the cost for materials and labor for the amount of items in column 1.
3. The third column shows how much revenue is made by selling those items at the stated price. (\$1.95 ea.)
4. The fourth column shows the profit & loss, that is the amount when column 2 is subtracted from column 3 in that row.
5. The fifth column shows the cost per unit. You can see how it decreases as quantity increases.

In our sample, if ACME were to purchase 1000 Widgets at 1.95, XYZ Corporation would make 1050 dollars profit. This allows us to ask ourselves the question, "Should I quote a smaller piece price and make less profit"?

If you feel the competition is asking 1.95, you may very well afford to and still make a sizeable profit for your company.

This program would make an excellent exercise tool for a class in marketing where the class would be divided up into buyers and sellers. The following format might be used:

- sellers would have established price sheets for material purchases.
- price sheets may be from different suppliers and reflect different costs.
- sellers would have access to only some of the price sheets and would have to try to give the best estimates with the price sheets they have.
- buyers would contact all sellers

requesting estimates on more than one product manufactured by the seller and purchase the lowest bids only.

- each product requested by the buyer would have from 5 to 10 material components.

- the buyers would have 10 identical orders with each of the sellers.

The object of the exercise would be to see which seller made the most money and which buyer spent the least.

- Ed. Ramblings Cont.

- 64K RAM expandable
- 80 column internal CRT
- Built in disk drive - either stringy or 3 inch floppy
- Standard ASCII pushbutton keyboard

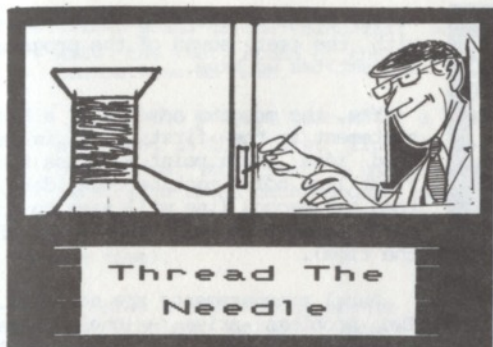
Although no decisions have been made as to the final design, the units are being conceived to compete in the small business market at a fraction of the price the competition offers. Our impression is that they will be heavily constructed and will offer a serious threat in that area.

USER INTERACTIVE VIDEO GAMES

What's the next step in arcade games? Picture yourself in a capsule that's boosted several feet in the air, bobbing on a column of air to simulate flight in space. CRTs inside show enemy spacecraft and challenge the "pilot" to destroy them with lasers.

Such is the scenario of a prototype tested recently in Diamond Js, a bar in Detroit.

Result - people waited in line for hours to pay \$2 for two minutes of playing time.



Warren Fricke of Depew, NY submitted this little ditty for your pleasure. He writes:

I am enclosing a 2K game you may use. I ran the program several times before copying it and used the CHR\$ function deliberately in several places so that there would be no mis-understanding of the characters intended. The display jerks a bit like using PAUSE with graphics, but most people would not find that objectionable in this application.

In this game, a player threads a series of needle-like eyes of an upward-scrolling column, first from the left, then from the right using the <L> and <O> keys for direction. In all, ten eyes will pass the tip of the thread. At the end, the results will be tabulated. The game is a test of reaction time and is very easy using both hands. It should, however, be played with the index finger of only one hand working both of the widely separated keys.

The game has the potential of being made much harder, simply by setting the needle eyes closer together, or by varying the spacing so that a player cannot develop a matching cadence. I'll leave that to the individual who "likes a little meat on the bone".

```

5 LET C=0
10 LET E=0
15 LET G=0
20 PRINT AT 20,8;CHR$ 151+CHR$
151+CHR$ 151
25 PRINT "NEEDLE "+CHR$ 7+CHR$
3+CHR$ 3+CHR$ 3+CHR$ 132+" LAUN
CHER"
30 LET B=11
35 POKE 16418,4
40 FOR T=1 TO 11
45 PRINT AT 12,B;CHR$ 52
50 LET D=B
55 LET B=B-(B>7 AND INKEY$="1"
)>(B<11 AND INKEY$="0")
60 PRINT AT 12,D;CHR$ 27
65 SCROLL
70 IF T>0 AND T<11 THEN PRINT
AT 19,9;CHR$ 136
75 IF T=11 THEN PRINT TAB 9;CH
R$ 14
80 PRINT AT 12,B;
85 IF PEEK (PEEK 16398+256*PEE
K 16399)=14 THEN LET C=C+1
90 IF PEEK (PEEK 16398+256*PEE
K 16399)=136 THEN LET E=E+1
95 NEXT T
100 LET G=G+1
110 IF G=11 THEN GOTO 200
120 GOTO 40
200 PRINT AT 2,19;"TOTAL NO. OF
";TAB 20;"NEEDLES = ";G-1
210 PRINT AT 6,18;"NO. OF NEEDL
ES";TAB 20;"THREADED = ";C
220 PRINT AT 10,19;"NO. OF BAD"
;TAB 20;"ATTEMPTS";TAB 20;"# GOO
FS = ";E
230 PRINT AT 15,16;"PRESS ENTER
";TAB 17;"FOR NEXT GAME."
240 INPUT Z#
250 FAST
260 CLS
270 SLOW
280 RUN

```

Ed, note - Mr. Fricke is a Septegenarian who has started teaching computer classes using the TS/ZX computers.



Letters To The Editor

Dear Ed,

Why is your magazine called Synchro-Sette?

I think it would be very helpful if you would put the program title in the first line of a program (in a REM) - even better if you could make an aural announcement of the title before each cut on the tape. I do this on my tapes and it really helps when trying to find particular programs.

Also, I think it would be helpful to use even-increment line numbers in your programs. I know it makes no difference to the computer, but it would aid when trying to type in a skipped line when trying to type in a program from the magazine.

And, do you know anything regarding the legality of transmitting computer programs over ham radio? Does the ZX-81 output ASCII?

One last thing - could you write a computer program that would alphabetize words? Thank you for your time and keep up the good work. I really enjoy Synchro-Sette. Sincerely -

J. Cable - Lehigh Acres, FL

Dear John,

So many questions - oh well, here goes:

Synchro-Sette incorporates the

<sink> sound of the <Sinc>lair name with the <set> sound of the program cas<set>tes we have.

Yes, the program name after a REM statement in the first line is a good idea (mute point - unless the first line holds machine code data, then the second line will have to do - I'm too lazy to use REMs most of the time).

Aural announcements are no good. Two problems arise - one - where most duplicating equipment will obliterate the announcement and, two - the announcement may become distorted enough to cause the computer to crash when a LOAD is attempted over it.

Even incremented lines is a good idea in theory but not in practice. After a program or routine is written, it may be found that another line has to be introduced in between two existing lines to get a desired effect. This can happen over and over again. Most programmers start their programs with increments of ten. Sometimes it is found that certain lines won't be needed so they are then deleted. Also, it is much more practical to write certain routines or program lines at higher line locations because they can be tested before the rest of the program is written. A menu-driven program, for instance, is easier to format where a number is assigned to a variable and then a GOTO command multiplies that number by 100 or 1000. This usually means there will be large gaps of missing line numbers in the listing.

A solution to this situation is to use a line-renumbering program to "clean up" the listing, so to speak. But then you'd be missing out on a valuable experience, wouldn't you (ha ha)?

No, the ZX-81 does not output ASCII code. For information regarding this subject, contact:

QXZ - The Journal Covering
Amateur Radio & Sinclair
Computers

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2025 O'Donnell Dr.
Las Cruces, NM, 88001
Ambrose 'Bo' Barry
W4GHV/5 - Editor

Your request for a program that alphabetizes words was fully covered in our October/82 Computer Tutor article, "Out Of Sorts". Benchmark tests were provided to compare the listed sort routines - Ed.

Dear Ed,

How do you change Apple programs with READ, DATA & RESTORE statements over to Sinclair Basic?

A. Clow - Waldo KS

Dear Al,

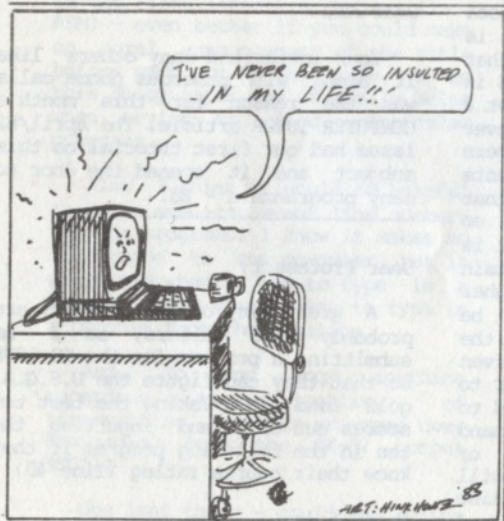
Your letter and many others like it along with numerous phone calls was the reason for this month's COMPUTER TUTOR article. The April/82 issue had our first tutorial on this subject and it opened the door to many programmers - Ed.

Dear Professor,

A great many of your readers are probably also golfers, so I am submitting a program for the TS-1000 so that they can figure the U.S.G.A. golf handicap. Taking the best ten scores out of 20 and inputting the ten in the following program if they know their course rating (line 40).

Here it is:

```
1 DIM S(10)
2 FOR J=1 TO 10
3 PRINT AT 1,1; "ENTER SCORE
  NUMBER?"
4 PRINT AT 1,20; J
5 INPUT S(J)
6 NEXT J
10 FOR I=1 TO 10
20 LET G=G + S(I)
30 NEXT I
40 LET G=G/10 - 70.8
50 LET G=G*.95
60 PRINT "HANDICAP IS",G
70 STOP
```



- Letters Cont.

NOTE: the 70.8 in line 40 is the course rating on the course I play - change it to the course rating where you play.

Sincerely, J. Haigh - Okeechobee, FL

Dear Joe,

The old Professor gave your letter to me. He said golf isn't his bag. Tennis is more his racket - Ed.

NEWS

FOR PARENTS

You may be able to help your children do better in school. Motivation, is an essential factor in determining whether a youngster gets good grades. Motivation can take many forms, but it's always best if it's a part of the learning process itself - a good book, or a fun-to-use educational tool, for example - something that makes learning an enjoyable experience.



A new easy-to-use computer is making learning fun for many youngsters these days. Based on an innovative four chip design, this compact, lightweight, fully programmable personal computer has a 2K byte static memory. It uses cassette-loaded programs ranging from educational material to entertainment which can be shown over any television set. It's also the first personal computer to break the \$100 price barrier, making it affordable to many parents who would like their children to enjoy the educational benefits of having their own computer system. Also included in this Timex Sinclair 1000 is a step-by-step instruction manual custom-written for the first time computer user. It includes a course on fundamental programming, enabling users to develop custom programs in BASIC, the standard language of personal computers.

Giving a personal computer as a gift to your children shows that you're concerned about helping them improve their grades. If you care, your child is more likely to care as well.

RETURN OF ANTIGONE

by Roger Stenhope

Patrian was a second generation nexus, mostly human, with bio-chips surgically implanted throughout his metabolism. His alter-responder was a droid he had affectionately called Proctor. Base was gone. All that remained were a few like himself and their responders. All could communicate with each other even though little of that was done these days.

Little food, shelter - the Jovian system was earth-like but sparse. Proctor attended to his needs even without a mind. Atmosphere was constantly drifting or being lost.

The great wars parched the system clear out to the Three/Four belt. Mars was gone, incinerated by solar expansion. The Jovian system was safe for another thousand years.

The man-computers were to be the answer, salvation, the destiny of evolution.

Patrian knelt at the channel. Proctor was a thousand miles away gathering frozen hydrogen at the polar region. The channel held great mysteries for him.

After a while, the dark outline of the mirror could be seen. He knew after many years that this wouldn't change. He waited till dusk, but the mirror still wouldn't shine.

He left.

"Marcus! Where are you? Marcus"! Ever since the rehab, he was like a kid again. He better come home soon or they'd miss the prayer meeting.

The phone rang. Edith wiped the flour from her hands and walked to the nook.

"Hi Ma! Hows Dad? I got to ask him about that old car in the barn. Jim thinks he might know of a place that might have some parts".

"Listen Julie, tell Jim it would be better if he didn't excite Dad right now. You know his rehab won't be complete till May. Besides, he's not here anyway."

"But Ma, Jim went to a lot of trouble. Dad and him were talking about getting together when the weather gets warmer."

"I just don't think it would be good at this time. I know the doctors say he can do almost anything he wants. When you guys come up for the holidays, we can talk about it. Listen, I got to go now. We're late for the prayer meeting and you know how Dad gets when supper's not ready. My love to the kids".

"Bye Mom, tell Dad we'll see him next week".

The old pick-up pulled up the drive. Edith ran to the window. Marcus was lowering the gate and pulling a fir tree.

Edith hurriedly put on her old wool blazer and ran outside.

"Marcus, let me help. You know the doctor told you to take it easy"!

The big man strained pulling the tree from the truck bed. Blind since the Viet Nam war, he had only recently regained his sight. Marcus was a marvel for his age. He could never again expect to see the better side of seventy. Edith stood by him after the war and kept him from becoming too self indulgent. She lifted his spirits any way she could. They even got a tandem bike and on weekdays, when traffic was light, would travel through the New England countryside and Edith would describe the changing seasons and paint a mental picture for Marcus.

The operation was accomplished quickly. Within three months, Marcus could see completely. The bio-chips received data from his new eyes and tricked his brain into an image-response condition where for

all practical purposes, his sight was superior to that which could be provided by nature.

The rehab period was something else, though. Muscle responses, co-ordination patterns, teaching a seventy-seven year old body to live again - these were all things that had to be learned. The biggest problem was over-reaction the doctors said. The euphoria of doing things again might cause problems. The prayer meetings helped. Things were taught slowly - with grace and understanding.

"I can handle it, Edith. Hold the door open. I want to get this in the family room before the kids get here. Do we still have those old ornaments from your mother"?

Edith held the door as he dragged the eight foot fir through. "My God, I haven't seen those things in years. I think I put them in the barn after Jeff went to college".

"Robbie's picking us up for the meeting. Do you want a sandwich or do you have time to sit down"?

Marcus felt dizzy. He put his hand to his head and leaned against the table. "I think I'll skip the meeting tonight. I feel a little tired". He sat down and after a while, the spell left. "Did Jim call while I was out"?

Edith set the table. She knew the prayer meetings were important. She also knew that Marcus should rest. "Julie called and said they will be coming this weekend. Jim thinks he can get some parts for the old Metro. He'll talk to you about it then. Made some fresh bread today. Go wash up"!

"Why was the transmission blocked this afternoon. I tried all frequencies"!

Patrian studied the tentacled machine before him. A grotesque conglomeration - LEDs, claws and gears in miniature.

"I was practice-competing. I want Fischer this time. You play Capablaca".

Proctor went silent for a few moments. "Potgorney's was higher. What's Capablanca's current rating"?

"3176 - just went up since Lasker and Steinitz were trounced"!

Proctor's LED display flashed on and off briefly. "Fischer is still over 3300"!

"I'll give you rook and move"!

Proctor's gears squeaked noticeably. Happiness abounded. "I'll take queen's rook - D2 to D4 and E2 to E4".

Over Proctor's antenna, Patrian could see light. He knew the mirror was shining. He had to get away.

"Where are the Taylors? They were slated for tonight, weren't they"?

Bob Svenson stood up. "Marcus took tired - thought he'd skip tonight. He'd been chopping trees this afternoon".

Pastor General Linton turned from the lecturn to the secretary and whispered. She jotted something onto her note sheet and looked back at the Pastor.

"Let us bow our heads ... we thank thee, oh Lord, for blessing us with the divine guidance we are about to receive ... and for the mending of our impairments that we have already received. We humbly beseech thee to make evident the path of righteousness to these humble followers as outlined in the 93rd Congressional Reports of 1989 and inspired by your will, Amen".

- to be continued :::